

REMARKS

Claims 1, 21 and 30 were rejected under 35 U.S.C. 112 as indefinite. Claims 1, 3-6, 8-12 and 14-20 were rejected under 35 U.S.C. 103(a) as unpatentable over Dawson (US 4,001,774) in view of Fechalos et al (US 4,737,950). Claims 21-25 and 29-30 were rejected under 35 U.S.C. 103(a) as unpatentable over Dawson in view of Tubel et al (US 5,959,547). Claim 7 was rejected under 35 U.S.C. 103(a) as unpatentable over Fechalos et al in view of Dawson and further in view of Jain et al (US 5,959,547). Claim 26 was rejected under 35 U.S.C. 103(a) as unpatentable over Dawson in view of Tubel and further in view of Jain et al. Claim 27 was rejected under 35 U.S.C. 103(a) as unpatentable over Tubel in view of Dawson and further in view of LoGalbo et al (US 5,220,676). Claim 28 was rejected under 35 U.S.C. 103(a) as unpatentable over Tubel in view of Dawson and further in view of Fechalos.

Claims 1, 12, 21 and 30 have been amended to clarify novel and nonobvious features of the invention. No new matter was added.

A feature of the present invention is a downhole network integrated into a drill string comprising a plurality of tubulars configured to form an electromagnetic network when coupled to one another in a column to penetrate a subsurface formation. The tubulars forming the network are configured with magnetically conductive, electrically insulating elements at both ends of each tubular for signal passage along each tubular and between the coupled tubulars. (See, e.g., Fig. 8 in the present application; Figs. 6 & 17 in US Patent 6,670,880, incorporated by reference in the present application). Independent claims 1, 12 and 21 have been amended accordingly. The cited art, individually or in combination, does not disclose or suggest all the features of amended claims 1, 12 and 21.

Dawson does not teach or suggest the claimed invention. Dawson proposes the use of two electrical conductors (40, 43) to extend, one from the drill bit and one from the surface, within the drill pipes to operate as antennas. The surface antenna (43) is literally run into and extended within the inner bore of the pipes as the pipe connections are made. The downhole antenna (40) is mounted to extend upward within the inner bore of the lower pipes. Not only is the signal propagation proposed by Dawson different compared to the present invention, but the entire system is unlike Applicants' invention.

Applicants' invention entails tubulars equipped with magnetically conductive, electrically insulated elements at both ends of each tubular for signal passage. There are no antennas

extending within the inner bore of Applicants' invention. Dawson proposes running the antenna from the surface (43) internally within the pipes to overlap with the bottom antenna (40). Not only is this impractical to implement, but "as the well is drilled deeper, the transmitting antenna, which retains its original length, will follow the drilling bit down into the well. This means that as the well is drilled deeper, the length of overlap of the transmitting and receiving antennas will diminish. When they cease to overlap the communication link may be broken ..." (Column 5, lines 45-51). In contrast, Applicants' claimed invention performs signal passage, via the magnetically conductive, electrically insulated elements at the ends of the tubulars, along each tubular and between coupled tubulars. Applicant's invention does not entail running or extending any conductors within the pipes as the pipes are connected. Furthermore, Applicants' invention allows for signal passage from the surface to the drill bit across and along each tubular section, no matter how deep the well is drilled since there is no use of overlapping antennas. Thus not only does Dawson lack any disclosure relating to Applicants' invention, it actually teaches away from the claimed invention. Fechalos lacks any disclosure relating to a downhole network incorporating the claimed signal operations, or to any other subsurface application for that matter.

Neither Dawson nor Fechalos, alone or in combination, teach or suggest all the limitations of the claimed invention. Applicants respectfully request withdrawal of the Sections 112 and 103 rejections with respect to amended claims 1, 3-6, 8-12, 14-21 and 30.

Tubel et al does not teach or suggest the claimed invention. Tubel proposes a system for the control of oil and gas production wells. A well becomes a production well after a borehole is drilled and appropriate casing/liners are placed (typically cemented in place and perforated) in a drilled-out borehole. The drill string used in the drilling phase is extracted from the borehole after the well is penetrated to the desired depth, and then the permanent casing/liners are placed into the existing borehole to commence production. Applicants' claimed invention relates to a network integrated into a drill string formed by a column of interconnected tubulars to actually drill a well. This is not a trivial distinction. Furthermore, Tubel proposes a downhole control system using acoustic signals/coded pressure pulses for communication (See col. 10, lines 3-41). Tubel describes a system entailing a wireless or wired communication channel. The proposed wired system entails the use of a very long electrical wire or cable (referred to as a "wireline") that can be disposed in the well casing/liner precisely because, in the production phase of a well,

there is no drilling involved and the casing/liner provides a stationary conduit for long wireline cables. Applicants' claimed invention performs signal passage and operations, via magnetically conductive, electrically insulated elements at the ends of the tubulars, along each tubular and between coupled tubulars integrated into a drill string, for drilling operations. Thus the wireline configuration proposed by Tubel also teaches away from the claimed invention. Expressly missing from Tubel et al is any discussion relating to a drill string comprising a plurality of coupled tubulars forming an electromagnetic network and performing the claimed operations.

Neither Dawson, Tubel, nor Fechalos, alone or in combination, teach or suggest all the limitations of the claimed invention. Further, as discussed above, Dawson and Tubel teach away from the claimed invention. Applicants respectfully request withdrawal of the Section 103 rejections with respect to amended claims 21-25 and 28-30.

Jain et al also lacks any disclosure relating to a drill string comprising a plurality of coupled tubulars forming an electromagnetic network and performing the claimed operations. As discussed herein, neither Dawson, Jain, nor Tubel, alone or in combination, teach or suggest all the limitations of the claimed invention. Further, as discussed above, Dawson and Tubel teach away from the claimed invention. Applicants respectfully request withdrawal of the Section 103 rejections with respect to amended claims 7 and 26.

LoGalbo et al also lacks any disclosure relating to a drill string comprising a plurality of coupled tubulars forming an electromagnetic network and performing the claimed operations. Expressly missing from LoGalbo is any discussion relating to a drill string, a subsurface electromagnetic network, or any type of subsurface application. LoGalbo, like other cited references, lacks any disclosure relating to drilling operations and any appreciation for the complexities involved with signal transfer and processing in networks established via coupled tubulars for such drilling operations.

Applicants respectfully request withdrawal of the Section 103 rejections with respect to amended claim 27.

In sum, Applicants respectfully submit that the cited art does not meet the standards to render the amended claims obvious under 35 U.S.C. 103(a). Applicants request passage to issuance of amended claims 1, 3-12 and 14-30. If there are any questions concerning the above, and/or to advance the prosecution of the application, please contact the undersigned at 281 878-5675.

Respectfully submitted,

/Victor H. Segura/

Electronically signed by Victor H. Segura, Reg. No. 44329, on 9/9/2008.

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